



Characterization of Livestock Grazing Management Systems in Semi-arid Kiteto and Kongwa Districts of Tanzania

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Abstract

Agro-silvopastoral technologies, such as traditional *in situ* natural regeneration systems, represent strong pathways to alleviate livestock feed shortages during dry seasons in the tropical region, including Tanzania. A study was carried out among selected eight villages of Kiteto district (Njoro, Ilkiushiobor, Katikati, Ndedo, Makame, Olkitkit, Lergu and Ngapapa villages) and four villages of Kongwa district (Mlali, Laikala, Moleti, and Manyusi) of semi-arid Tanzania based on specific objectives : (1) to analyze livestock grazing management systems, (2) determine available grazing land area, and (3) to determine forage biomass productivity and nutritive potential of conventional feed resources through chemical composition and *in vitro* feed digestibility. The information adds value on livestock management systems in the two districts. Key informant interviews, panel discussions and resource mapping of the grazing land resources were carried out among 293 participants. A point sampling technique was adopted to assess herbage biomass productivity by vegetative clipping at 5 cm above the ground in five sites. Feed nutritive potential was assessed through chemical composition and *in vitro* digestibility. Qualitative data on grazing land management systems of the agro-silvopastoral technologies were analysed for simple descriptive statistics using SPSS. Quantitative data on the herbage biomass productivity and feed nutritive potential were analysed into means and standard errors using SAS statistical software. Kongwa district was characterised by lack of firm livestock grazing management systems whereby during wet seasons, (from December to June), cattle are transferred to distant pastures on hilly areas where there is no cropping compared to dry seasons whereby cattle are normally grazed on crop residues such as maize and sorghum stovers. In Kiteto district in contrast, Maasai pastoralists set aside portions of pastures as differed feeds known as *Alalili* for livestock grazing while the latter system is not practiced among the predominant Kagulu and Gogo agro-pastoralists of Kongwa district. In both districts, during wet seasons, the livestock are transferred to distant pastures. In Kiteto district, two types of '*Alalili*' are recognised; '*Alalili longshu*', which refers to portions of pastures set aside for mature cattle herd, and '*Alalili lo roho*', which refers to portions of pastures set aside for a calf herd. Fodder productivity was variable between districts ($P < 0.05$) and sites ($P < 0.05$), ranging from 1.5-3.5 t DM/ ha, mainly due to both grazing management and site specific characteristics. Available grazing lands are highly variable across sites depending on specific land use systems. Utilisation of feed resources under *Alalili*, during dry seasons, is limited by their lower concentration of feed crude protein (CP) of 40 to 50 g/kg of dry matter (DM) than the recommended feed CP of 80 g/kg DM for optimal rumen functioning and enhanced animal productivity. Enriched tree planting of rangelands with fodder trees and forage legume species that offer high resilience to the different agro-ecologies, drought tolerance, biomass productivity and nutritive value represent one of the viable options for enhanced rangelands productivity and thus improved ruminant livestock productivity.

Keywords: Alalili, Silvo-pastoral systems, Maasai, Tanzania, Chemical composition, *in vitro* digestibility.

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